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Angela Ko
University of Puget Sound

Jenna Williams
University of Puget Sound

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Ko, Angela and Williams, Jenna, "Impact of Garden Spaces on Dementia Residents: Translating Evidence-Based Research into Clinical Practice" (2016). *School of Occupational Master's Capstone Projects*. 11.
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Impact of Garden Spaces on Dementia Residents: Translating Evidence-Based Research into
Clinical Practice

May 2016

This evidence project, submitted by

Angela Ko, OTS
Jenna Williams, OTS

has been approved and accepted
in partial fulfillment of the requirements for the degree of
Master of Science in Occupational Therapy from the University of Puget Sound.

Project Chairperson: Kirsten Wilbur, MSOT, OTR/L

OT635/636 Instructors: George Tomlin, PhD, OTR/L, FAOTA; Sue Doyle, PhD, OTR/L, CFE

Director, Occupational Therapy Program: Yvonne Swinth, PhD, OTR/L, FAOTA

Dean of Graduate Studies: Sunil Kukreja, PhD

Keywords: garden, dementia, evidence-based research

Abstract

The research addressed the following focused question: “Do garden spaces decrease the incidence of behaviors such as combativeness and agitation, psychiatric medication use, depression, falls, cognitive decline, and sleep disturbance in clients with dementia in a residential facility?” The research team collaborated with staff at a skilled nursing facility in an urban area of the Pacific Northwest. Appraisal of existing research revealed multiple potential benefits of residents’ with dementia utilizing garden spaces for wandering and/or therapeutic activities. Based on these findings, the research team recommended implementation of an on-site garden. To support the implementation of these findings, the research team produced an in-service for rehab staff and administrators, a handout for family members with a loved one with dementia in a residential facility, and a handout for occupational therapy practitioners. It is recommended that the facility consider the findings of the CAT and the implementation products in the future development of their programming for residential clients with dementia.

Executive Summary

Our research topic emerged from our collaborating clinician's general area of interest in the improvement of quality of life for residential clients with dementia or Parkinson's Disease (or both). We began our project with several hours of general searching on scholarly search engines in the area of quality of life for clients with dementia. This preliminary research led to several results coming into our search results that involved the effects of gardens for individuals with dementia, in which our clinician expressed great interest.

While many of the studies in our CAT lacked rigor and some studies showed no significant impact of garden interventions, the overall conclusion was that garden spaces, both as places for wandering and as environments for horticultural activities, offer a variety of potential benefits for residents with dementia in long-term care facilities, including lessened agitation and aggressive behavior; less depression and anxiety, with less need for use of psychiatric medications; improved sleep quality, cognition, stress level, and general quality of life; and fewer and less severe falls. Additionally, garden spaces offer benefits for family of residents with dementia and for staff working with these clients in residential facilities.

This research implies that consumers should consider features such as an on-site garden space in their decision of where to place their loved one for residential dementia care, as a garden may improve the quality of life for the resident. For occupational therapy practitioners, these findings may influence the manner and setting in which they conduct their interventions for clients with dementia, as well as the types of change they promote at their facility (e.g. advocating for the development of an on-site garden). For researchers, the studies point toward many potential benefits of garden spaces, but the current evidence lacks rigor and replicability, suggesting the need for further studies, particularly those of experimental nature.

Following the initial research process, implementing our findings into a knowledge translation project proved difficult due to our collaborating clinician leaving the facility and thus terminating her involvement in the project. Our knowledge translation products currently include an in-service for staff and administrators at a skilled nursing facility, a handout for OTs at a skilled nursing facility, and a handout for families with loved ones in a skilled nursing facility. With somewhat short notice, our Course Faculty Mentor was able to arrange for us to deliver our in-service to a different skilled nursing facility to a small audience of rehabilitation staff.

CAT Paper and Table

Focused Question:

Do garden spaces decrease the incidence of behaviors such as combativeness and agitation, psychiatric medication use, depression, falls, cognitive decline, and sleep disturbance in clients with dementia in a residential facility?

Prepared By:

Angela Ko and Jenna Williams

Date Review Completed:

February 9, 2016

Clinical Scenario:

It is estimated 47.5 million people have dementia and there are 7.7 million new cases each year (World Health Organization, 2015). Dementia is one of the major causes of disability and dependency among older individuals worldwide (World Health Organization, 2015). Currently, there is no treatment or therapy available to cure or alter its progressive course (World Health Organization, 2015). Within institutional settings, participation in activities is a major component of therapeutic programming. The collaborating clinician for this project was an occupational therapist and rehabilitation director at a skilled nursing home facility that serves residents with dementia. She sought to understand if providing access to a garden space would be beneficial to their quality of life by providing a meaningful space for wandering and potentially for therapy interventions. The addition of this space may contribute to reductions in outcomes such as behavioral disturbances, sleep disturbances, falls, depression, and the need for psychiatric medications, which are several factors that contribute to overall quality of life.

Review Process**Procedures for the selection and appraisal of articles****Inclusion Criteria:**

Articles were included if they addressed indoor and outdoor garden settings as an intervention for residents with dementia in a long-term care facility and included at least one designated outcome of interest (problem behaviors, depression, medication, sleep disturbance, cognition, or falls).

Exclusion Criteria:

Articles were excluded if they were non-primary publications, duplications, written in a language other than English, addressed gardens as in intervention in a non-institutionalized care setting, participant population did not address Alzheimer's disease or any form of dementia, or designated outcomes (cognition, sleep, problem behaviors, medication use, falls) are mentioned resultant from an intervention unrelated to gardening.

Search Strategy

Categories	Key Search Terms
Patient/Client Population	Residents with dementia in a care facility. Key search terms: dementia OR Alzheimer* OR "vascular dementia"
Intervention (Evaluation)	Garden spaces (as wander spaces <i>and/or</i> treatment environments) Key search term: garden*
Comparison	vs. current treatment environments and techniques

Outcomes	<p>problem behaviors (e.g. combativeness, agitation, etc.), psychiatric medication use, depression, falls, cognition, and sleep disturbance</p> <p>Key search terms: behav* OR agitation OR disturb* OR combativ* OR psych* OR *depress* OR anxiety OR medic* OR drug* OR prescription* OR pharmac* OR sleep* OR insomnia OR cogniti* OR fall</p>
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Databases and Sites Searched	
<p>PubMed: Searched on 10/21/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND garden*</p> <p><i>107 results; 103 excluded; 4 entered into CAT table (numbers include same articles found in multiple search engines)</i></p> <p>Searched on 11/7/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND horticultur*</p> <p><i>8 results; 8 excluded</i></p>	
<p>CINAHL: Searched on 10/14/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND garden* AND behav* OR agitation OR disturb* OR combativ* OR psych* OR *depress* OR anxiety OR medic* OR drug* OR prescription* OR pharmac* OR sleep* OR insomnia OR cogniti* OR fall</p> <p><i>36 results; 26 excluded; 10 entered into CAT table (numbers include same articles found in multiple search engines)</i></p> <p>Searched on 11/7/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND horticultur*</p> <p><i>95 results; 95 excluded</i></p>	
<p>PsycINFO: Searched on 10/20/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND garden* AND behav* OR agitation OR disturb* OR combativ* OR psych* OR *depress* OR anxiety OR medic* OR drug* OR prescription* OR pharmac* OR sleep* OR insomnia OR cogniti* OR fall</p> <p><i>69 results; 60 excluded; 9 entered into CAT table (includes same articles found in multiple search engines)</i></p> <p>Searched on 11/7/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND horticultur*</p> <p><i>19 results; 18 excluded; 1 entered into CAT table</i></p>	
<p>OT Seeker: Searched on 10/20/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND garden* AND behav* OR agitation OR disturb* OR combativ* OR psych* OR *depress* OR anxiety OR medic* OR drug* OR prescription* OR pharmac* OR sleep* OR insomnia OR cogniti* OR fall</p> <p><i>0 results</i></p> <p>Searched on 10/20/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND garden*</p> <p><i>0 results</i></p> <p>Searched on 11/7/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND horticultur*</p> <p><i>0 results</i></p>	
<p>ScienceDirect: Searched on 10/20/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND garden*</p> <p><i>3 results; 2 excluded; 1 entered into CAT table (includes same articles found in multiple search engines)</i></p> <p>Searched on 11/7/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND horticultur*</p>	

<p><i>0 results</i></p> <p>American Journal of Occupational Therapy (AJOT): Searched on 10/21/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND garden* <i>6 results; 6 excluded</i></p> <p>Searched on 11/7/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND horticultur* <i>0 results</i></p>
<p>Canadian Journal of Occupational Therapy (CJOT): Searched on 10/21/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND garden* AND behav* OR agitation OR disturb* OR combativ* OR psych* OR *depress* OR anxiety OR medic* OR drug* OR prescription* OR pharmac* OR sleep* OR insomnia OR cogniti* OR fall <i>0 results</i></p> <p>Searched on 10/21/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND garden* <i>14 results; 14 excluded</i></p> <p>Searched on 11/7/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND horticultur* <i>0 results</i></p>
<p>British Journal of Occupational Therapy (BJOT): Searched on 10/21/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND garden* AND behav* OR agitation OR disturb* OR combativ* OR psych* OR *depress* OR anxiety OR medic* OR drug* OR prescription* OR pharmac* OR sleep* OR insomnia OR cogniti* OR fall <i>0 results</i></p> <p>Searched on 10/21/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND garden* <i>114 results; 114 excluded</i></p> <p>Searched on 10/21/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND garden* AND behav* OR agitation OR disturb* OR combativ* OR psych* OR *depress* OR anxiety OR medic* OR drug* OR prescription* OR pharmac* OR sleep* OR insomnia OR cogniti* OR fall <i>0 results</i></p> <p>Searched on 11/8/15 with terms dementia OR Alzheimer* OR “vascular dementia” AND horticultur* in full text <i>721 results; 721 excluded</i></p>

Quality Control/Peer Review Process:

Some search terms had to be omitted in some search engines. For instance, ScienceDirect, AJOT, BJOT, and CJOT did not offer enough search engine boxes to search with our outcome keywords. For these engines, we searched “dementia OR Alzheimer’s OR vascular dementia” AND “garden*”.

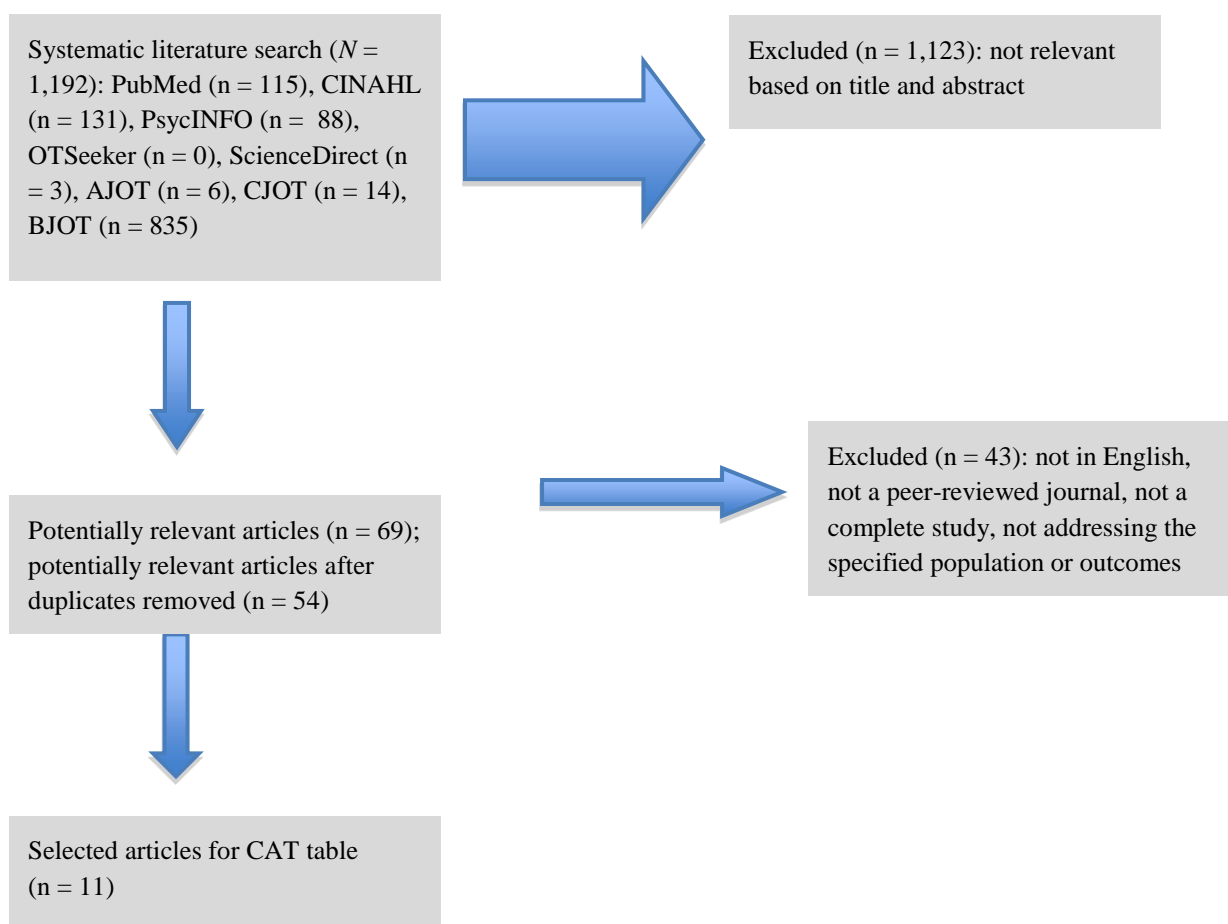
Searching the 8 aforementioned databases with our search criteria yielded a total of 349 results, 297 of which were rejected for irrelevancy based on the title and abstract. 52 potentially relevant articles were screened in full text. Following review, 28 more articles were discarded for the following reasons: not written in English, not a peer-reviewed journal, not a complete study (e.g. a study proposal), and not addressing the specified population or outcomes. 14 duplicates were removed (same articles found in multiple databases). This left 10 articles fitting our criteria.

In the process of searching PubMed, one article used the term “horticultural therapy” in reference to

garden interventions. After this observation, we searched our same databases using this term as a synonym for “garden*” (dementia OR Alzheimer’s OR vascular dementia AND “horticultur*”). This additional search yielded 843 results, 826 of which were excluded based on title and abstract irrelevancy. 17 articles were reviewed for qualification. 15 were discarded for the same reasons mentioned in above paragraph. 1 duplicate was removed, leaving 1 result, which was entered into the CAT table.

These two search processes are depicted below in the flow chart, with the search results combined.

Classmates Alina Muller, Sally Winkel, and Liliya Bachinskaya; Professor Sue Doyle (Course Faculty Mentor); Professor Kirsten Wilbur (Project Chair); and Library Liaison Eli Gandour-Rood were involved in various stages of our review process.



Results of Search*Summary of Study Designs of Articles Selected for the CAT Table*

Pyramid Side	Study Design/Methodology of Selected Articles	Number of Articles Selected
Experimental	1.66* Meta-Analyses of Experimental Trials 1 Individual Blinded Randomized Controlled Trials ___ Controlled Clinical Trials ___ Single Subject Studies	2.66
Outcome	.66* Meta-Analyses of Related Outcome Studies ___ Individual Quasi-Experimental Studies ___ Case-Control Studies 3 One Group Pre-Post Studies	3.66
Qualitative	.33* Meta-Syntheses of Related Qualitative Studies 1.5* Small Group Qualitative Studies ___ brief vs prolonged engagement with participants ___ triangulation of data (multiple sources) ___ interpretation (peer & member-checking) ___ a posteriori (exploratory) vs a priori (confirmatory) interpretive scheme ___ Qualitative Study on a Single Person	1.83
Descriptive	.33* Systematic Reviews of Related Descriptive Studies 2.5* Association, Correlational Studies ___ Multiple Case Studies (Series), Normative Studies ___ Individual Case Studies	2.83
Comments: *Several articles were classified in multiple categories. <ul style="list-style-type: none"> One article was classified in two categories (descriptive and qualitative component). The article was divided and is represented as 0.5 in each category. Two articles were classified in three categories. Each article was divided and is represented as .33 within each category. <ol style="list-style-type: none"> Qualitative, Outcome, Experimental Descriptive, Outcome, Experimental 		11 articles

Garden as Treatment Environment (Horticultural Activities)

Author/Year	Study Objectives	Level/Design	Participants	Intervention and Outcome Measures	Results	Limitations
Luk, Lai, Li, Cheung, Lam, Li, Ng, Shiu, So, Wan (2011)	To examine the effects of horticultural activity on agitation in nursing home residents with dementia	Single-blinded RCT with pretest/post-test design (E2, I)	<p>$N = 13$ Intervention: $n = 7$ Control: $n = 6$</p> <p>92.9% female Mean age: 84.9 Mean number with medical dx besides dementia: 3.7 14.3% anxiety 7.1% depression 7.1% schizophrenia Mean number of medication: 5</p>	<p>I: For 6 weeks, 2x per week, and 30 minutes sessions, residents participated in a horticultural activity in an outdoor garden. Control group participated in tabletop activities aimed to provide similar levels of sensory stimulation and social interaction.</p> <p>O: <i>Cognitive Impairment</i> Mini-Mental State Examination (C-MMSE) <i>Agitation</i> Cohen-Mansfield Agitation Inventory (CMAI)</p>	No significant reduction of agitation resulted from intervention. Decreasing trend of non-aggressive behavior observed in experimental group. Lower cognitive function was positively correlated with decreased frequency of agitation.	Small sample size. Absent methodological description to replicate study.
Kamioka, Tsutani, Yamada, Park, Okuizumi, Honda, T., . . . Mutoh (2014)	To summarize the evidence from RCTs on the effects of horticultural therapy (HT)	Meta-Analysis of Blinded RCTs (EI, III) Reviewed: 4 studies (E2, I)	<p>4 RCTs reviewed, published in 1990 to 2013, 7 databases Search Criteria: RCTs studies, Use of HT was, outcomes defined as ‘all cure and rehab effects in accordance with ICD-10.’</p> <p><u>Study 1:</u> $n = 129$ participants with dementia</p> <p><u>Study 2:</u> $n = 24$ participants with severe mental illness</p> <p><u>Study 3:</u> $n = 53$ older adults living in a nursing home</p> <p><u>Study 4:</u> $n = 42$ individuals with CVAs</p>	<p>I: Participation in indoor and outdoor HT activities</p> <p><u>Study 1:</u> 2x per week for 6 weeks</p> <p><u>Study 2:</u> 1 hour HT session for 10 days</p> <p><u>Study 3:</u> Indoor HT sessions for 8 weeks</p> <p><u>Study 4:</u> 5x per week 1 hour HT sessions for 6 weeks</p> <p>O: <u>Study 1:</u> Affect (Apparent Affect Rating Scale) Engagement (Menorah Park Engagement Scale)</p> <p><u>Study 2:</u> Depression (Depression Anxiety Stress Scale 21) Work Behavior Assessment (WBA), Wellbeing (Personal Wellbeing Index)</p> <p><u>Study 3:</u> Life Satisfaction, Revised UCLA Loneliness Scale, Lubben Social Network Scale</p> <p><u>Study 4:</u> Self-esteem/powerlessness scale, Beck Depression Inventory (BDI), Neurobehavioral Cognitive Status Exam</p>	The effect of HT improved mental health (anxiety and depression) and adaptive behavior. Improvement on adaptive behavior for dementia pts may be attributed to HT being adapted to the pts’ functional level.	Small sample sizes. Studies had limited methodological descriptions. Study heterogeneity prevented meta analysis. Outcome measures varied greatly between studies.

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				(NCSE), Motor-Free Visual Perception Test (MVPT)		
Lee & Kim (2008)	To examine the benefits of indoor gardening on sleep, agitation, and cognitive function among institutionalized dementia pts	1 group pretest post-test (O4), III	<p>$N = 23$</p> <p>Dementia Levels:</p> <p>Alzheimer's disease: 4,</p> <p>Vascular dementia: 18</p> <p>Unspecified dementia: 1</p> <p>Inclusion Criteria:</p> <p>Institutionalized in a SNF, classified as mild or severe dementia, recognized by RN to have sleep disturbance and/or agitation, physical ability to participate in gardening.</p>	<p>I: For 4 weeks, 2x per day, 1 hour per session, pts participated in indoor gardening tasks of fast-growing, edible plants.</p> <p>O: <i>Sleep:</i> 24-hour sleep log recorded by RN</p> <p><i>Agitation:</i> Modified Mansfield Agitation (M-CMAI) <i>Cognition:</i> Hasegawa Dementia Scale</p>	Pts' parameters of sleep (sleep onset, napping, nocturnal sleep time/sleep efficiency) agitation, and cognition displayed statistically significant improvements.	Lack of control group. Small sample size, lack of pts' demographic data, potential procedural confound unaddressed: absent description of the process of recording sleep data needed to establish internal validity and reliability.
Anderson, Bird, MacPherson, McDonough, & Davis (2011)	To ascertain if a multisensory (Snoezelen) room is more effective than sensory stimulation provided by a therapeutic garden space	One group pre-post study and group qualitative study less rigor (O4 & Q3), IV & V	<p>$N = 12$ ($N = 9$ and $N = 5$ in final data)</p> <p>Subjects were permanent residents at a care facility, had diagnosis of severe dementia (types not specified), and regularly demonstrated challenging behaviors associated with dementia.</p> <p>Mean age 89 years, range 81-94 years.</p>	<p>I: 3 sessions in Snoezelen room and 3 sessions in garden space. 12 staff were paired with 12 subjects to provide intervention. Sessions once weekly, 6 weeks, 20+ minutes. Staff were also encouraged to take clients into Snoezelen room as needed for distress.</p> <p>O: Coding of observed behaviors into 4 categories (disturbed/disengaged, neutral, engaged, very engaged). Focus group with staff conducted 2 months post-intervention to assess perceptions of Snoezelen and garden benefits and feasibility of interventions.</p>	<p><u>Descriptive:</u></p> <p>In both groups, reduction in disengaged/disturbed behaviors was noted after either Snoezelen or garden session. However, sample size for garden group was too small to statistically evaluate. No significant differences in behavior were observed across groups over time. No significant differences were observed between Snoezelen and garden conditions.</p> <p><u>Qualitative:</u> difficulties in implementing 1:1 sensory intervention time. Some staff found</p>	Lack of control group. Small sample size (had dropout/problems with assessment), caused inability to assess complete data for garden intervention. Lack of information (activities, etc.) for replicability of garden intervention.

					the garden setting more difficult for engaging clients.	
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Garden as Wander Space

Author, Year	Study Objectives	Level/Design	Participants	Intervention and Outcome Measures	Results	Limitations
Edwards, McDonnell, & Merl (2012)	To evaluate whether a garden can improve the quality of life of dementia care residents	1 group pretest post-test (O4), III	<i>N</i> = 10 9 female, 1 male Age Range: 79-90 years old Dx: Alzheimer's Disease: 7 Mixed Dementia: 1 Unspecified Dementia: 1 Level: Severe: 4 Moderate: 3 Mild: 3	I: Residents and/or staff/ family members were provided voluntary access to an universally designed, interactive, sensory wander garden at a long-term care facility. O: <i>Quality of Life:</i> Dementia Quality of Life Instrument (DEMQOL and DEMQOL Proxy) <i>Depression:</i> Cornell Scale for Depression in Dementia (SCDD) <i>Cohen-Mansfield Agitation:</i> Agitation Inventory (CMAI) Mini-Mental State Examination (MMSE).	Significant improvements in QOL scores (increased by 12.8%), mean depression scores (decreased by 13.3%), mean agitation scores (decreased by 46.7%). The garden was widely viewed as enhancing quality of life for residents; relieving stress for residents, staff, and family members; and offering a space for outdoor activity and therapy. Other observed benefits for residents with dementia include: better sleep, better appetites, improved mood, less sundowning, and new topics for conversation.	Lack of control group. AARS results not discussed in much detail. Brief engagement with participants. No mention of peer or member checking.
Mather, Nemecek, & Oliver (1997)	To observe if a wander garden connected to a residential care facility decreased problem behaviors for clients with Alzheimer's dementia.	1 group pretest post-test (O4), III	<i>N</i> = 10 7 females, 3 males Age range: 69-100 y.o. (mean 83 y.o.) Dx: Alzheimer's dementia All participants were taking medications for symptom control of	I: Participants given free access to a wander garden during summer. Garden contained patio, flower beds, high walls, and figure-8 walking path O: Baumgarten, Becker and Gauthier's checklist (measures agitation, wandering, sleep disturbances)	No significant difference was found for behavior changes during or after intervention period. However, participants who showed the greatest change, showing improvements in behavior and sleep disruption, were those who used the wander garden most frequently.	Small sample size and lack of control group. Not all descriptors of outcome measures (behaviors) were listed. Lack of information regarding how much staff encouraged residents to use the garden. (Lack of staff

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			<p>Alzheimer's and other diseases.</p> <p>Mean age 89 years, range 81-94 years</p>			<p>facilitation may decrease clients' garden use.)</p>
<p>Murphy, Miyazaki, Detweiler, & Kim (2010)</p>	<p>To assess if visiting an outdoor wander garden affected agitation levels of seniors with dementia in a residential care facility. Also considered how much a client's ambulatory status affected the behavioral results.</p>	<p>Correlational study (D2), IV</p>	<p>$N = 34$ (all males, all veterans)</p> <p>Mean age 80.71 years, range 74-92 years.</p> <p>Type and severity of dementia not specified.</p> <p>62% walked unassisted; remainder used walker or wheelchair.</p>	<p>I: All subjects given access (scheduled and unscheduled) to outdoor wander garden space. Measures were conducted prior to the garden opening and monthly for the following year.</p> <p>O: Cohen-Mansfield Agitation Inventory (CMAI) short form, monthly</p>	<p>A significant association exists between visit to a wander garden and decreased agitation scores, with the effect being variable between individuals. The effect was greater for those exhibiting higher agitation at baseline. Little to no reduction in agitation scores was present for non-ambulatory individuals visiting the garden. Use of garden declined in winter months.</p>	<p>Limited detail on design of intervention (unclear if access to garden was at-will or restricted to certain hours, or how non-verbal or non-ambulatory clients were able to access the garden). Subjects' self-selection for study could affect results. Time recorded in days with garden visits, not number of minutes.</p>
<p>Detweiler, Murphy, Kim, Myers, & Ashai (2009)</p>	<p>Observe if use of a "wander garden" impacts number and severity of falls and scheduled psychiatric medications for dementia patients</p>	<p>Correlational study (D2), IV</p>	<p>$N = 28$</p> <p>Participants ranged from 74-92 years at beginning of study (mean = 80.5 years). Type and severity of dementia not provided. All were male residential clients in a dementia unit, present for 9+ months of year studied. 2 groups established based on garden use: High User</p>	<p>I: Dementia clients given access to a wander garden on the facility's property. Schedule and other details of accessibility not specified.</p> <p>O: Falls severity scores measured by Institutional Fall Committee rating scale. Psychiatric medication use (antidepressant, antipsychotic, anxiolytic, and hypnotic) measured by descriptors of drug as "high-dose," medium-dose," or "low-dose," reported in person-month units.</p>	<p>Garden users had a roughly 30% decrease in the number of and severity score of falls. There was a statistically significant reduction in scheduled use and dosage of high-dose antipsychotic medication, but not significant reduction for antidepressants, anxiolytics, or hypnotics. A significant reduction in need for</p>	<p>Convenience sample, small sample size, voluntary dosage of exposure to garden space, measurement of time in garden potentially lacks accuracy. Lack of detail regarding garden availability and accessibility inhibits replication.</p>

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			Group (HUG) and Low User Group (LUG).		secondary antidepressants was also found. Effects on falls and scheduled medication use were higher for the HUG than the LUG.	
Whear, Coon, Bethel, Abbott, Stein, Garside (2014)	To examine the evidence of garden/outdoor spaces' effect on the mental and physical well-being of people with dementia	Systematic review (Q1/O1/E1) III Reviewed: 5 prep-post studies (O4, III), 2 RCTs (E2, I), 1 prospective cohort study (E3, II) 7 qualitative studies 2 Q2,V 5 Q3,V	17 studies reviewed, published in 1992 to 2012 14 databases used Search Criteria: Studies meeting free text terms, no date or language restrictions applied	I: Indoor and outdoor garden spaces O: <i>Quantitative outcomes:</i> Dementia-related behavior: Agitation (CMAI), Pacing/Walking/Exit Seeking, Trespassing: (observation), Aggression/violence: (incident reports / observations) Emotional Outcomes: Pleasure/Anxiety/Interest (CMAI) Physical Outcomes: Sleep/Physical Activity/Sitting (observation) Medication (Medical reports), Falls (reports) <i>Qualitative Themes:</i> Nature of activity, Interaction, Impact, Mechanism, Negatives	<u>Quantitative</u> The limited evidence suggests spending time in a garden space is associated with a decrease level of agitation in clients with dementia. <u>Qualitative:</u> Residents, family, and staff appreciated the presence of the garden. Garden provided an environment for interaction with staff and visitors. Barriers included the limited number of staff needed to accompany residents.	Systematic review was thorough, searching 14 databases for published works and contacting 38 organizations to search for unpublished, related reports. Low number of RCTs, poor methodological quality of quantitative studies (e.g. ½ did not report data collection tools), small sample sizes of studies, participants were institutionalized in care homes.

Garden as Both Wander Space and Treatment Environment

Author, Year	Study Objectives	Level/Design	Participants: Sample Size, Description, Inclusion and Exclusion Criteria	Methods for enhancing rigor	Themes and Results	Limitations
Hernandez (2007)	To analyze the effects of therapeutic gardens (both as wander spaces and activity spaces) in two residential dementia-care units, particularly in relation to the garden design.	Qualitative study with less rigor (Q3), V	<i>N</i> = 45 Staff (<i>n</i> = 28), families of residents (<i>n</i> = 12), and architects & landscape architects (<i>n</i> = 5) were interviewed. Type and severity of residents' dementia not specified.	Residents with dementia also assessed using Apparent Affect Rating Scale (AARS). Triangulation of qualitative data via interviews with facility staff, family of residents, and residents.	The garden was widely viewed as enhancing quality of life for residents; relieving stress for residents, staff, and family members; and offering a space for outdoor activity and therapy. Other observed benefits for residents with dementia include: better sleep, better appetites, improved mood, less sundowning, and new topics for conversation.	AARS results not discussed in much detail. Brief engagement with participants. No mention of peer or member checking.
Gonzalez & Kirkevold (2014)	To provide a review of the benefits associated with the use of sensory gardens and horticultural therapy (HT) activities in dementia care	(O1/D1/E1), I Reviewed: 2 case studies (V, D3), 1 survey (V, Q2), 11 pretest/post-test (III, O4), 2 RCT (I, E2)	16 Studies reviewed, published in 1997 to 2012, 6 databases used Search criteria: Studies with search term 'healing garden', 'horticultural therapy', 'restorative garden' and 'wander garden' combined with dementia and Alzheimer. Limited to peer-review publications in English.	I: Access to a sensory garden and/or participation in HT activities O: # of Articles Addressing Outcomes (Sensory garden): Behavior (agitation, wandering, positive behaviors): 6 Sleep pattern: 2 Falls: 1 Well-being/affect: 3 Cognition: 0 Medication: 3 # of Articles Addressing Outcomes (Horticultural activities): Behavior Outcomes: (agitation, wandering, positive behaviors): 9 Sleep pattern: 2	The available and limited research support the benefits associated with dementia patients' behavioral issues, well-being, and affect. Support for improved sleep patterns, fewer falls, and reduced psychotic medications were reported. Results are consistent across interventions (HT activities and access to a sensory garden).	Small sample sizes, lack of RCTs, available research largely influenced by few researchers, scoping review does not synthesize or evaluate evidence levels.

				Falls: 0 Well-being/affect: 5 Cognition: 2 Medication: 0		
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Summary of Key Findings:

*These summaries should stay true to your literature (DO NOT go beyond the scope of what was reported by the researchers), but this is where you integrate the findings from the studies based on the type of study. You should **NOT** include any critical analysis addressing implications or what to do with the data at this point.*

Summary of Experimental Studies

Residents of a residential facility for individuals diagnosed with dementia demonstrated a decreasing trend of aggressive behavior after participating in horticultural activities compared to counterparts engaged in traditional, paper-based activities providing similar levels of sensory and social participation (Luk et al., 2011). Additional beneficial results were observed in another study examining the impact of engagement in horticulture activities, specifically improving symptoms of anxiety and depression (Kamioka et al., 2014). Mixed results were observed when examining agitation. Residents in a residential facility for individuals with dementia who had access to a wander garden exhibited decreased levels of agitation; no significant results were observed for residents who participated in a horticultural activity (Whear et al., 2014; Luk et al., 2011). Overall, the quality of these studies was mediocre, with small sample sizes and limited descriptions of their methodologies.

Summary of Outcome Studies

Residents with dementia in a long-term care facility who took part in indoor horticultural activities showed significant improvement in sleep quality, cognition, and agitation (Lee & Kim, 2008). Residents with dementia in a long-term care facility who had access to a wander garden had mixed results: one study showed significant improvements in depression and quality of life scores, while another study showed no significant improvements (Edwards, McDonnell, & Merl, 2013; Mather, Nemecek, & Oliver, 1997). The latter study did indicate that those using the garden more had greater improvements in these measures, however (Mather, Nemecek, & Oliver, 1997). Differences between study results may be due to small sample sizes, different outcome measures, and lack of monitoring of how much the residents were encouraged to use the garden.

Summary of Qualitative Studies

An on-site garden, used either as wander space or a treatment environment or both, is perceived as improving quality of life, sleep, appetite, stress levels, and mood for residents with dementia, as well as offering benefits for residents' family members and staff working at the care facilities (Hernandez, 2007). Residents' family members and staff appreciated the presence of a garden that allowed for relaxation and could stimulate activities and memories. Some staff found it more difficult to engage clients in a garden space versus an indoor sensory environment (Anderson et al., 2011). A barrier to garden use included the limited time staff had to accompany residents outside regularly (Whear et al., 2014). Included qualitative studies were somewhat lacking in rigor and lacked apparent peer- or member-checking.

Summary of Descriptive Studies

Use of a garden space for wandering correlated with significant improvements in the following outcomes: number and severity of falls, scheduled antipsychotic and secondary antidepressant use and dosage, and agitation (Detweiler, Murphy, Kim, Myers, & Ashai, 2009; Murphy, Miyazaki, Detweiler, & Kim, 2010). Greater frequency of garden use correlated with greater impact (Detweiler et al., 2009). Clients' ambulatory ability also correlated positively with positive outcomes from garden use/exposure (Murphy et al., 2010). In one study where the garden was used as a setting for sensory stimulation and activities, the sample was too small to evaluate statistically (Anderson et al., 2011). The impact of sensory stimulation from the garden

environment appeared equal to that of a Snoezelen sensory room (Anderson et al., 2011). The quality of descriptive studies was relatively strong compared to other types of studies, but lacked detailed description of interventions and availability of garden to study participants.

Implications for Consumers:

Consumers who may be concerned with the research include individuals diagnosed with dementia as well as their family members, caregivers, and support network. With an aging population, the numbers of individuals with dementia, and thus the number of consumers, is likely to increase, making this information ever more relevant.

The evidence focuses on older adults with dementia who are institutionalized in a long-term care facility. Based on the available research, providing access to an on-site garden space and/or opportunities to participate in garden activities may improve quality of life outcomes for individuals with dementia.

Based on our critical analysis, consumers can support implementation of a garden space in skilled nursing and long-term care facilities through individual or collective actions, in order to influence individuals within positions of management. Family members, friends, and guardians of clients with dementia can serve as advocates on behalf of their loved ones by contacting the facility's ombudsman, pertinent staff members, and administration to demonstrate support for implementation of an on-site garden. To unite, family members, guardians, and/or friends of clients with dementia can join together to educate fellow peers and create a petition to demonstrate collective support. Family members and/or guardians who are potentially interested in transitioning their loved one with dementia to living at a nursing care facility may use the existing evidence to help make a more informed decision. Furthermore, residents' family members can increase the use of the garden by taking residents there during their visits. They may also consider informing rehabilitation staff about which garden activities may best suit the client based on previous interests (e.g. provide information on preferred flowers and vegetables), to further encourage use of and participation in the space).

Implications for Practitioners:

Occupational therapists and other health professionals who are concerned for the well-being of long-term care residents with dementia may have special interest in these results. As mentioned above, the size of this care population is likely to increase, making the information more valuable for practitioners. Though existing studies are limited and not entirely rigorous in quality, evidence suggests multiple positive impacts of garden space and/or garden activities on the well-being of clients with dementia. As such, those in positions of management of care facilities should take these results into consideration when deciding if a garden space should be installed on their property.

Garden interventions (activities and wander space) may have a greater impact on outcomes of agitation, depression, sleep (onset and disruption), falls, psychotropic and secondary antidepressant needs, and overall quality of life. Agitation in particular was shown as the most common outcome to be significantly improved in multiple studies. However, specific intervention designs and dosages varied between studies (or, in many cases, were not provided), and several studies lacked rigor, making it hard for practitioners to implement the findings at their sites of care.

Based on our analysis of the research, the addition of either an indoor or outdoor garden space would likely be beneficial for the residential population of clients with dementia. Though the feasibility of construction and maintenance will need further discussion among stakeholders, the research points toward substantial benefits of the addition of a garden for long-term clients with dementia.

The literature included in the CAT indicates that residents may benefit from a garden regardless of whether the space is utilized for therapeutic activities such as planting, weeding, and watering the garden space. The decision to implement a “wander garden” versus a more structured atmosphere for garden-based therapy would be best made with consideration to the specific needs and logistics of the rehabilitation team.

Though no adverse effects were mentioned in the literature reviewed, practitioners should still consider such effects prior to implementing a garden space. Outcomes such as client injury with garden tools, consumption of plants and soil, and exposure to inclement weather should be anticipated and addressed prior to construction of the garden. Additionally, practitioners and stakeholders should consider pragmatic details of implementing the garden intervention which were often omitted from the studies in the CAT table. For example, how many and what type of therapists/staff will oversee the garden, what type of training will be required for these staff, how often will the space be available for wandering or therapy activities, considerations of design in terms of accessibility, and how much the garden will cost to build and maintain.

Implications for Researchers:

The studies included in this CAT provide a notable base of research toward the benefits of garden spaces in residential dementia care. However, the quality of many of the existing studies lacks rigor. Adequate detail regarding exact methods of intervention is also absent, making replication difficult. Additionally, a striking lack of experimental research design exists in this area. The addition of trials with a control group (not receiving access to or intervention in a garden space) would add to the rigor of the existing evidence. Additionally, research focusing on other outcomes, such as alertness and level of verbal communication, would add further depth to existing evidence.

Given that garden spaces are considered in a favorable light in the analyzed research, further researchers may do well to consider what obstacles therapists and healthcare administrators find most challenging when attempting to implement and maintain a therapeutic garden space.

Bottom Line for Occupational Therapy Practice/ Recommendations for Best Practice:

Ideally, the evidence reviewed will promote the construction of more garden spaces in residential dementia-care facilities, as well as more structured rehabilitative activities in these spaces. This may be particularly useful evidence when considering the goal of reducing agitation (measured most frequently across the studies). However, this recommendation comes with many contingencies and may not be feasible for a number of facilities.

Regardless of whether an OT is working in a facility that has a garden space, s/he can incorporate this evidence into practice by considering how other treatment activities or environments might utilize similar components of gardening. For instance, the OT can consider indoor planting activities for higher functioning clients with dementia, as well as offering therapy outside when feasible, to increase exposure to the fresh air and sunlight.

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Involvement Plan

Introduction

The project began as a collaboration between the UPS research team and the former Director of Rehabilitation and occupational therapist at Life Care Center of Puyallup (LCCP). However, in December 2015, the collaborating clinician had to end her involvement in the project due to unexpected circumstances. Afterwards, we experienced communication difficulties with LCCP and found ourselves trying to move forward with a project without a collaborating clinician. Since we had never visited LCCP, we lacked a detailed understanding of the full context of the setting (for instance, to what extent a garden space exists there currently and how it is being used therapeutically). Given this, we plan on moving forward with creating a handout for occupational therapists, a handout for family members of individuals with dementia in a residential facility, and an in-service for healthcare providers and administrative staff at a skilled nursing facility that has no garden space currently. We delivered the in-service in early May of 2016 to a small group of rehabilitation staff at a different skilled nursing facility (Life Care Center of South Hill).

Context

Barriers to a successful implementation of our research with LCCP include the unexpected circumstances of the original collaborating clinician, breakdown of communication between LCCP interdepartmental staff about who could take over the project, and a lack of communication between LCCP and the UPS research team. Additionally, the UPS research team did not have a chance to visit LCCP to obtain a clearer understanding of the current status of garden development and its use in programming, which caused difficulties in forming an audience-specific in-service.

Strong support and guidance from our course faculty mentor Sue Doyle was a significant facilitator for enabling us to effectively translate our research into practice by arranging for us to present our research to a relevant audience at another skilled nursing facility.

Task/Product and Target Dates

The translation of knowledge from our CAT to practitioners consists of two information products for clients and one in-service for practitioners, with suggestions for how outcomes could be monitored if the project had continued to completion with the original collaborator.

Task/Product	Deadline Date	Steps with Dates to Achieve the Final Outcome
An in-service (30 minutes) for the professional staff in a skilled nursing facility	April 26, 2016	Draft of PowerPoint--April 10 Final PowerPoint--April 26
A handout for occupational therapists based on the in-service lecture that explains the use of gardens with persons with dementia	April 26, 2016	Draft of handout--April 10 Final handout--April 26
A handout for family members of a person with dementia in this facility that explains how a garden space may benefit their loved one	April 26, 2016	Draft of handout--April 10 Draft of handout--April 26

Outcomes

Outcome measures can help determine whether a change occurs in an aspect of decision making or clinical practice (Law & MacDermid, 2014). We envision several potential instruments and processes to measure the outcomes of the planned in-service presentation and both handouts. To evaluate the effectiveness of the in-service, a survey was administered following the in-service presentation. The format of the survey incorporated Likert scaling and open-ended questions to attempt to measure the effectiveness of the research, presenters, and overall presentation. Demographic information such as the respondents' disciplines and years of

experience was also collected for analysis. To monitor the outcome of the informational handout for residents' family/caregivers, the healthcare facility could consider adding a question or two on residents' intake forms, assessing if information regarding the facility garden was provided to residents and family/caregivers and if so, if it affected their decision to choose LCCP. This may provide valuable information to the facility administration and serve as rationale for potential garden program development.

Processes and Outcomes

We presented our in-service on May 3, 2016, to four rehabilitation staff members at Life Care Center of South Hill in Puyallup, Washington. In attendance were one occupational therapist, one occupational therapist assistant, one rehab aide, and one physical therapist. After the presentation and discussion, we provided them with copies of the handout for OTs and the handout for caregivers of clients with dementia. Specific feedback on the in-service is provided below in the copied surveys.

The process for creating our products was relatively straightforward and was not met with significant obstacle after deciding the proposed target audience would be healthcare professionals and administration employed at a skilled-nursing facility that did not have an on-site garden. Specifically, the prospective team of health care professionals includes occupational therapists, physical therapists, and speech therapists. Administration team members may potentially include supervisors, executive directors, and regional directors. Due to the diversity of professionals participating in an in-service, it is expected there will be varying levels of knowledge about the profession of occupational therapy, research, and the goals of our knowledge translation activity.

To promote cohesive understanding, special attention was given to language use, layout and design, and application of the evidence. The written language aimed to communicate complex information using non-technical language. Likewise, we strived to ensure the presentations slides did not present too much information at one time to avoid overwhelming the participants. We designed the presentation to incorporate pictures that were aesthetically pleasing and relevant to the topic to attract attention. Lastly, rather than present a comprehensive analysis of research, the in-service presentation aimed to focus on application of the evidence specifically

within the facility's setting. Specific disciplines including occupational therapy, physical therapy, speech therapy, and administration are identified at various points in the in-service presentation and provided examples of potential discipline-specific treatment ideas related to the application of the garden spaces. Discussion questions were developed to encourage the attendees to reflect on his or her clinical or work practice and engage in a dialogue to identify the potential barriers and facilitators associated with implementation of the knowledge translation.

When developing handouts for families and caregivers of individuals with dementia, special considerations were given to content, ease of readability, and presentation. The content of the handout includes information to help family members and caregivers to take action to incorporate the use of garden spaces in clear and specific language. We also considered the potential emotional lens of the reader when s/he views the information. Understanding our audience may potentially be children or spouses of an individual with dementia, the language of the handout strives to be supportive through using statements of encouragement such as acknowledging the stress related to the process of searching for a long-term care facility for their loved. Use of the second-person narrative “you” was used to promote a personal connection, as if the handout was speaking directly to the family member or caregiver. Ease of readability ensured the language was clear and avoided use of jargon. Presentation of the handout promoted reader comprehension through strategic organization of text and pictures.

Development of the handout for occupational therapist practitioners followed many of the principles related to content, ease of readability, and presentation. Notably, the message was targeted to the audience of occupational therapy practitioners. The type of language used in the handout is consistent with terminology used among occupational therapy professionals.

Content of the handout focused on the application of the use of garden spaces, specifically providing examples of treatment ideas, which could potentially be incorporated into clinical practice. In addition, the handout provided examples of how garden spaces can potentially benefit other resident populations.

Handout for Occupational Therapists

Gardens, Dementia, & OT

Improving quality of life
for residential clients with
dementia



Research shows...

Gardens used as therapeutic
settings for **wandering** and/or
gardening activities may have
multiple positive outcomes for
residential clients with dementia,
including:

- LESS ANXIETY AND DEPRESSION
- LESS AGITATION
- IMPROVED SLEEP QUALITY
- IMPROVED APPETITE

- FEWER & LESS SEVERE FALLS
- LESS NEED FOR ANTIPSYCHOTIC & SECONDARY ANTIDEPRESSANTS
- IMPROVED OVERALL QUALITY OF LIFE



ADDITIONAL BENEFITS

Studies also suggest the presence of a therapeutic garden
offers stress reduction for residents' family members and



Using a Garden Space in OT Interventions

GARDEN ACTIVITIES FOR OTHER POPULATIONS

- **Strength training**—use a wheelbarrow to transport heavy items such as soil
- **Joint protection education**—introduce joint-friendly equipment such as trowels with adaptive handles
- **Body mechanics training**—use garden activities such as reaching for weeds or

THERAPEUTIC USES FOR CLIENTS WITH DEMENTIA

- **Purposeful activities**—planting seeds and starts, watering, weeding
- **Sensory stimulation**—gardens offer input for auditory, visual, tactile, and olfactory systems
- **Mobility**—a garden can be a more calming environment for ambulation
- **Reminiscence**—a garden may trigger memories for sharing

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Handout for Family and Caregivers

Gardens and Dementia

Tips For Family and Caregivers

What's the "dirt" on gardening?



Choosing the right place of residence for your loved one can be a big decision. There are many factors to consider in the planning process including cost, location, and amenities. That is why we want to help you make the most informed choice.

Research shows access and opportunities to use an on-site garden can provide mental and physical benefits for individuals with dementia. A garden space can be used as a safe, comforting environment for individuals to explore while reengaging the senses such as smell and sight. Gardens spaces can also provide a hands-on, engaging activity.

What are the Benefits?

- Promotes a Good Night's Sleep
- Improves Appetite
- Less Agitation
- Less Anxiety and Depression
- Fewer & Less Severe Falls
- Less Need for Antipsychotic & Secondary Antidepressants
- Improved Overall Quality of Life



What Can You Do?

Whether a prospective facility does or does not have an on-site garden space, here are some tips to promote the use of garden spaces for individuals with dementia.

Advocate

If the facility does not have an on-site garden, you can serve as an advocate on behalf of your loved one by contacting the facility's ombudsman, staff members, and administration to demonstrate support for a garden.



Use the Garden Together

Studies suggest the presence of a garden offers stress reduction for residents' family members. Consider taking walks together and spending time in the garden during visits with your loved one.

Incorporate Preferences & Interests

More frequent garden use is linked with greater benefits. To encourage use of and participation in the garden space, let staff members know what garden activities may best suit your loved one based on previous interests or preferred flowers and vegetables.



In-Service Presentation for Rehab Staff and Administrators

Impact of Garden Spaces on Dementia Residents: Translating Evidence-Based Research Into Clinical Practice

Angela Ko, OTS
& Jenna Williams, OTS

Focused research question:

Do garden spaces decrease the incidence of behaviors such as combativeness and agitation, psychiatric medication use, depression, falls, cognitive decline, and sleep disturbance in clients with dementia in a residential facility?

Inclusion criteria

- Include at least one of the following outcomes
 - Difficult/problem behaviors
 - Depression
 - Medication
 - Sleep disturbance
 - Cognition
 - Falls

Inclusion criteria

AND

- Includes an indoor or outdoor garden setting as an intervention for residents with dementia in a long-term care facility



The Garden Intervention

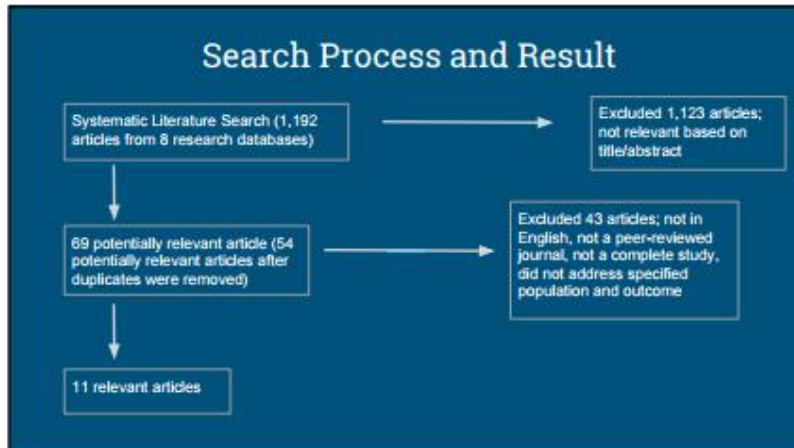
- Garden as wander space

OR

- Garden as setting for horticultural activities

Exclusion Criteria

- Non-primary publications
- Duplications
- Languages other than English (untranslated)
- Population without dementia
- Outcomes other than those listed
- Non-institutionalized settings



Search Results

- 11 research articles were categorized according to research design
 - Experimental (2.66 Articles)
 - Outcome (3.66 Articles)
 - Qualitative (1.83 Articles)
 - Descriptive (2.83 Articles)
- Several articles were classified into multiple categories

Summary of Experimental Studies

- Residents of a residential facility for individuals diagnosed with dementia demonstrated a **decreasing trend of non-aggressive behavior** after participating in horticultural activities compared to counterparts engaged in traditional, paper-based activities providing similar levels of sensory and social participation (Luk et al., 2011).
- Beneficial results were observed examining the impact of engagement in horticulture activities, with **improvement in anxiety and depression symptoms** (Kamioka et al., 2014).

Summary of Experimental Studies, cont'd

- Mixed results were observed when examining agitation.** Residents in a residential facility for individuals with dementia who had access to a wander garden exhibited decreased levels of agitation; no significant results were observed for residents who participated in a horticultural activity (Whear et al., 2014; Luk et al., 2011).



Summary of Outcome Studies

- Residents with dementia in a long-term care facility who took part in indoor horticultural activities showed **significant improvement in sleep quality, cognition, and agitation** (Lee & Kim, 2008).
- Residents with dementia in a long-term care facility who had access to a wander garden had **mixed results**: one study showed significant improvements in depression and quality of life scores, while another study showed no significant improvements though had greater improvements (Edwards, McDonnell, & Merl, 2013).

Summary of Descriptive Studies

- Use of a garden space for wandering **correlated with significant improvements** in the following outcomes: number and severity of falls, scheduled antipsychotic and secondary antidepressant use and dosage, and agitation (Detweiler, Murphy, Kim, Myers, & Ashai, 2009; Murphy, Miyazaki, Detweiler, & Kim, 2010).
- Greater **frequency of garden use** correlated with greater impact (Detweiler et al., 2009).

Summary of Descriptive Studies, cont'd

- Clients' ambulatory ability also correlated positively with positive outcomes from garden use/exposure (Murphy et al., 2010).
- The impact of sensory stimulation from the garden environment appeared equal to that of a Snoezelen sensory room (Anderson et al., 2011).



Summary of Qualitative Studies

- An on-site garden, used either as wander space or a treatment environment or both, is perceived as improving quality of life, sleep, appetite, stress levels, and mood for residents with dementia, as well as offering benefits for residents' family members and staff working at the care facilities (Hernandez, 2007).
- A barrier to garden use included the limited time staff had to accompany residents outside regularly (Whear et al., 2014).

Summary of Qualitative Studies, cont'd

- Residents' family members and staff appreciated the presence of a garden that allowed for relaxation and could stimulate activities and memories (Anderson et al., 2011).
- Some staff found it more difficult to engage clients in a garden space versus an indoor sensory environment (Anderson et al., 2011).



Implications for Consumers

- Access to on-site garden spaces and/or horticultural activities may improve quality of life for individuals with dementia.
- Family and friends of individuals with dementia in a residential facility can advocate for the construction of such gardens to benefit their loved ones by contacting facility administration and staff.



Implications for Practitioners

- Though studies are limited and somewhat lacking in rigor, evidence points toward multiple beneficial effects of therapeutic gardens for individuals with dementia.
- Particular areas of impact appear to be:
 - Agitation
 - Depression
 - Sleep
 - Falls
 - Psychotropic/antidepressant need
 - Quality of life
- Agitation was the most frequently noted outcome to be significantly improved with garden intervention.
 - However, dosages/protocol for the interventions varied or weren't provided.
 - Studies lacking in replicability.

Implications for Practitioners, cont'd

Overall recommendation for the facility: implementation of a garden space for therapeutic horticultural activities and for wandering.

Considerations

- Deciding between a wander garden or a garden for activities merits input from all members of the rehab and care teams.
- Resources to construct the space
- Resources to maintain the space
- Monitoring/safety considerations
- Schedule for accessing space
 - Assistance available for those with limited/no ambulation?

Implications for Researchers

- Existing evidence largely supports gardens for individuals with dementia in residential facilities.
- Many existing studies lack rigor.
- Studies lack detail regarding specific interventions used, making replicability impossible.
- Current lack of studies in this area using experimental design.



Ideas for Treatment (OT)

- Strength training
 - Move heavy objects such as a wheel barrow carrying heavy items such as soil and planting supplies
- Joint protection education
 - Use joint friendly, ergonomic tools such as a trowel with built up handle
- Body mechanics training
 - Using proper squatting techniques when reaching for weeds or plants, or lifting supplies
- Participation in a purposeful activity
 - Planting seeds/plants
 - Weeding
 - Watering plants

Ideas for Treatment (PT)

- Gait practice/training
- Standing endurance
- Use the garden as an environment for preparatory warm-ups & stretches to increase alertness prior indoor session



Ideas for Treatment (SLP)

- Using plants, flowers, etc. to stimulate conversation
- Horticultural activities that necessitate asking questions (e.g. asking partner for tools/supplies)
 - Possibility for OT and SLP co-treat



Ideas for Administration and Stakeholders

- Consider a Needs Assessment



Discussion Questions

Reflect on a past or current client who may have potentially benefited from use of a wander garden or participation in gardening activities. Describe how the use of a garden as an environment and/or horticultural-based activity could be incorporated into a treatment intervention.

Discussion Questions

What are some barriers or challenges which may prevent the use of a garden to be incorporated into your clinical practice?

Discussion Questions

What are some strategies or methods which can help to overcome these barriers?



No occupation is so delightful to me as the culture of the earth, and no culture comparable to that of the garden.
-Thomas Jefferson

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- Other images by Jenna Williams

In-Service Evaluation Forms

In-Service Presentation Evaluation Form

1. The organization of this presentation contributed to my understanding of the material.

1 2 3 4 5 6

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

(5)

2. The materials used in this presentation contributed to my understanding of the topic.

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

(5)

3. The presenters were well-prepared and knowledgeable.

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

6+5+5+5
10
21

4. The information I learned during this presentation was helpful to my professional development.

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

14 4+4+6+5
11 19
4.75

5. The information I learned during this presentation was relevant to our work practices.

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

4+5+5+4 = 18
(4.5)

Please describe your answer:

6. What was most helpful about this presentation?

Discussion/Interaction of topics

7. How could the presenters improve this presentation?

Inclusion of non therapy roles/aspects to topic (activities/nursing).

Thank You!

In-Service Presentation Evaluation Form

1. The organization of this presentation contributed to my understanding of the material.

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

2. The materials used in this presentation contributed to my understanding of the topic.

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

3. The presenters were well-prepared and knowledgeable.

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

4. The information I learned during this presentation was helpful to my professional development.

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree ⁶

5. The information I learned during this presentation was relevant to our work practices.

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

Please describe your answer:

6. What was most helpful about this presentation?

that the garden space can be
used for not only the therapists

In-Service Presentation Evaluation Form

- 1. The organization of this presentation contributed to my understanding of the material.**

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

- 2. The materials used in this presentation contributed to my understanding of the topic.**

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

- 3. The presenters were well-prepared and knowledgeable.**

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

- 4. The information I learned during this presentation was helpful to my professional development.**

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

- 5. The information I learned during this presentation was relevant to our work practices.**

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

Please describe your answer:

- 6. What was most helpful about this presentation?**

update on current literature and implications for evidence based practice.

1. What is your job title?

Assistant Director of Rehab
Occupational Therapist

2. How long have you been working in the profession?

13 yrs

3. How long have you been working at this facility?

2 months.

In-Service Presentation Evaluation Form

- 1. The organization of this presentation contributed to my understanding of the material.**

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

- 2. The materials used in this presentation contributed to my understanding of the topic.**

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

- 3. The presenters were well-prepared and knowledgeable.**

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

- 4. The information I learned during this presentation was helpful to my professional development.**

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

- 5. The information I learned during this presentation was relevant to our work practices.**

Strongly Disagree Disagree Somewhat Disagree Somewhat Agree Agree Strongly Agree

Please describe your answer:

- 6. What was most helpful about this presentation?**

learning specific behaviors that gardening can affect

- 7. How could the presenters improve this presentation?**

good job ~

1. What is your job title?

COTA

2. How long have you been working in the profession?

4 yrs

3. How long have you been working at this facility?

1 yr

Table of Schedule Dates of Completion

Task/Product	Deadline Date	Steps with Dates to Achieve the Final Outcome
An in-service (30 minutes) for the professional staff in a skilled nursing facility	April 26, 2016	Draft of PowerPoint--April 10 Final PowerPoint--April 26
A handout for occupational therapists based on the in-service lecture that explains the use of gardens with persons with dementia	April 26, 2016	Draft of handout--April 10 Final handout--April 26
A handout for family members of a person with dementia in this facility that explains how a garden space may benefit their loved one	April 26, 2016	Draft of handout--April 10 Draft of handout--April 26

Statement of Outcomes

To monitor the outcome of our in-service, we administered a survey afterward with Likert scales and open-ended questions, as described above in our Involvement Plan. Questions focused on the clarity of the presentation and the likelihood that the information presented might influence the audience's interventions. The survey also included open-ended questions. The presentation was regarded as effective. (See "Evaluation of Effectiveness of Tasks and Products" for details.)

To monitor the handout for family members of individuals with dementia, we would recommend that the facility add one or two questions onto residents' intake forms, asking whether family was given info about the garden and if it affected their decision of where to place their loved one for residential care.

To monitor the effectiveness of the handout for OTs, we would administer a survey afterward. Questions would again employ both Likert scale and open-ended questions in regard to how likely the practitioner would incorporate garden interventions if a garden were established, and what barriers they anticipated, etc. A follow-up survey could be administered several months later for those who did implement garden interventions, with questions regarding how smoothly they were able to incorporate the garden in their treatments and what obstacles or barriers had become evident.

Evaluation of Effectiveness of Task and Products

We presented an in-service presentation at Life Care Center of South Hill (LCCSH) to four staff members, which included a physical therapist, occupational therapist, occupational therapy assistant, and a rehabilitation aide. After the in-service presentation, LCCSH staff members rated its effectiveness thorough completing a survey, which included questions using a 6-point Strongly Disagree to Strongly Agree Likert scale and an open-ended format. Overall, the in-service presentation was well received. The majority of respondents agreed the organization and materials contributed towards understanding of the topic and the presenters were well-prepared and knowledgeable. Similarly, the majority of the respondents demonstrated they “somewhat agreed” the information was helpful to their professional development and work practices.

Table 1
In-Service Presentation Evaluation Scores

Question Content	<i>n</i>	<i>Mean</i>
Organization contributed to my understanding of the topic	4	5
Materials contributed to my understanding of topic	4	5
Presenters were well-prepared and knowledgeable	4	5.25
Information was helpful to my professional development	4	4.75
Information was relevant to our work practices	4	4.5

When asked to describe how the presentation could be improved, one respondent stated the inclusion of the roles of non-therapy staff members’ such as the activities department and nursing staff would be beneficial because such disciplines are most likely to use a garden space at LCCSH. During the discussion component of the in-service presentation, the respondent elaborated there is a lack of communication and collaboration between departments; thus it is

unlikely the rehabilitation team would be involved in presenting or sharing such research findings to other departments.

Another respondent noted more detail addressing how garden spaces were beneficial and the specific actions of the therapists when implementing the gardening intervention would have improved the presentation. Notably, such information is absent from the current literature; however, such feedback suggests how the research team can improve efforts to emphasize the limitations of the research during future presentations.

Measures to monitor the effectiveness of the handouts for family members and OTs were not implemented because it was determined the materials were not applicable to the facility's operations and primary population. LCCSH currently does not have an on-site garden and lack of space is a major barrier for future implementation. LCCSH primarily serves clients who receive short-term inpatient and outpatient rehabilitation and skilled nursing care prior to being discharged to return home. As a result, LCCSH staff members who participated in our in-service do not typically treat clients with dementia in long-term residential care.

While it was a valuable opportunity to present our findings in an in-service presentation, the research team predicts changes in staff behavior or efforts to implement an on-site garden are unlikely. When collaborating with Ms. Kussman, the research team had access to a potential opinion leader and/or change agent who had established credibility within the organization and could potentially influence organizational decisions. Such a connection was not available at LCCSH, thus the research team would be more likely be perceived as "outsiders" with less understanding of the implementation costs and overall feasibility. Because implementation of an on-site garden is a significant undertaking, acceptance and commitment from significant stakeholders need to be identified and gained in order to promote future change.

Analysis of the Overall Project Process

Overall, we found the actual process of finding existing research to be relatively easy. It took about 6 weeks to locate articles, screen them, and enter appropriate articles into the CAT table. We encountered our first problem when reporting back to our clinician at the end of the first semester of the project. It had been our understanding at the outset that LCCP was considering a garden but did not have one currently in place. In our follow-up meeting with the collaborating clinician, we learned there had been a misunderstanding, and that LCCP did in fact have a garden. To what degree of development and ways the garden is used remained unclear. We had hoped, in the second semester of our project, to visit LCCP and ascertain the current garden use. However, due to the collaborating clinician's departure and the subsequent miscommunication about who would continue oversight of the project, we did not have this opportunity, which made making appropriate, audience-focused knowledge translation products more difficult. However, despite experiencing the real-life barriers to implementing knowledge translation of evidenced-based research into clinical practice, we still believe translational research has a pivotal role to the profession of occupational therapy for the benefits of our patients.

Our involvement in this innovative research project was beneficial to our learning and professional development. It provided us the opportunity to hone our ability to strategically evaluate and synthesize pertinent information from research articles, a skill that will further promote our ability to use evidence-based practices as future clinicians. It also gave us the experience to design and present an in-service program, which strengthened our ability to communicate information effectively to practicing healthcare professionals and future professional peers.

Recommendations For Future Follow-on Projects

Due to the difficulties continuing collaboration with Life Care Center of Puyallup following the departure of our collaborating clinician, the research team does not anticipate any follow-on projects will arise from this one. However, should LCCP or another skilled nursing facility choose to implement a therapeutic garden on-site, we could foresee the need for an additional research project to investigate if any particular garden designs are shown to be more therapeutic or more feasible than others. Likewise, it is worth investigating how existing skilled nursing facilities or comparable residential settings' therapeutic gardens can be modified in order to promote greater resident utilization, especially residents with dementia. Research has demonstrated accessibility and universal design contributes to an increased likelihood of established garden spaces to be used in residential settings (Edward et al., 2014). A more focused investigation of research of this type may need to branch outside of the types of search engines used for the initial project and delve into material in horticultural or landscape-design literature.

In addition to the use of horticultural-based elements such as plants, the current literature also demonstrates potential benefits for residents with dementia when outdoor garden spaces incorporate interactive sensory components such as memory boxes to encourage reminiscing and engagement (Edward et al., 2014). Future research projects seeking to investigate methods to maximize the benefits of outdoor garden spaces may find the inclusion of specifically designed sensory gardens to be valuable.

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Acknowledgements

We thank Dr. Sue Doyle and Professor Kirsten Wilbur for their guidance and assistance throughout the research process. We would also like to show our gratitude to Ms. Tre Kussman for working with us during the initial stages of this research project.

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